The current hospital transfusion practices and procedures in Uganda

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Chapter 9

Discussion

This thesis examined the current hospital transfusion practices. It also addressed factors that directly or indirectly influence these practices. These included; information flow between suppliers and users of blood, adequacy of blood supplies, quality of bedside blood ordering and administration procedures, adherence to available operational documents and usefulness of a restrictive blood ordering strategy in surgical practice. It has been established that there are shortcomings in the quality of in-hospital systems that are key in management of the transfusion chain in the clinical setting. These include lack of organizational management structures, inadequate human resources, un-answered customer issues, inadequate equipment and consumables, poor documents and records keeping and an un-conducive work environment. Strategies to address some of the above problems have been identified, including a strategy of improved blood management, the surgical blood order equation as a useful tool in peri-operative blood ordering in femoral fracture surgery and a better containment of the time line in the procurement process.

9.1 ORGANIZATIONAL AND MANAGEMENT ISSUES

The observations have established that there are no responsible persons to oversee, or policies to regulate in-hospital transfusion processes in Uganda.
In Uganda it is not standard practice to seek an informed consent from patients or responsible persons to minors before administration of blood. The other example that shows shortfalls in administrative structures is the irregular pretransfusion testing sample acquisition in Ugandan hospitals. There are no strict policies to regulate recruitment of particular staff for a particular task, like trained phlebotomists would be charged with drawing a pre-transfusion test sample. Any clinician, including students, can perform this procedure with no accurate process description or standard operating procedures (SOPs). This compromises patient safety because of the many human and clerical errors that can occur at this stage. An example to this effect is poor patient and test tube identification that leads to a sample of blood ending in a wrong tube therefore initiating a chain of events that end up in an incompatible transfusion with fatal effects. Additionally, there are no regulatory standards in the hospital transfusion laboratories to ensure quality control at pre-transfusion sample reception. This affects the quality of the compatibility tests and the patients' transfusion outcome. Poor and incomplete reporting and documenting of adverse transfusion events and mishaps form another paucity in the current in-hospital transfusion practices in Uganda. Fortunately, a number of participating clinicians have appreciated this organizational and management gap. They have suggested an urgent need for formation and facilitation of hospital transfusion committees (HTCs) which will be responsible for the development, approval and implementation of policies, processes and procedures.

An established hospital transfusion administrative structure such as a functional HTC is a prerequisite in the proper running of in-hospital transfusion practices. It is responsible for policy development and approval, general transfusion administration, attending to clinical consultations and education, training and skills development of all concerned staff and a continuous monitoring and evaluation of the entire in-hospital transfusion chain as the core of a hemovigilance system focused on improvement of practices.

To date much effort has been directed to development and implementation of policies to ensure safety and adequacy of blood products in the procurement setting. Minimal attention has been put to blood safety procedures in the clinical setting more so in the developing world. As early as 1975 Cohen and Pierskal [1] in their study on simulation models of blood bank inventory management, had found that well selected policies on blood ordering, cross match and issuing greatly influenced optimal blood bank stock management. They found that compared to the last in first out (LIFO), a first in first out (FIFO) policy on blood bank stocks was characterized by lower in-hospital blood shortages and outdates. The concerns of blood safety in the procurement setting have been intensified due to the HIV/AIDS outbreak and other emerging TTIs. This is characterized by increased use of technological advancements in blood production and processing environments which is not reciprocated in the clinical setting. [2]

The presence of a functional HTC creates a favorable environment in the clinical setting for researchers to conduct studies that impact directly on patient safety and influence policy reviews. [3] Whitsett and Robichaux [4] were able to indentify blood administration problems through an audit of bedside practices in which they compared directly observed incidents against information derived from administrative incident reports. Saxena and others [5] were able to investigate and provide constructive feedback to concerned clinicians about underutilization of red blood cell concentrates and platelets in Los Angeles County University of Southern California Medical Center. In an effort to assess the consequences of possible transfusion-transmitted diseases as well as cost-benefit estimation of new blood safety interventions, Kamper-Jørgehsen and others [6] were able to establish survival rates in a population of 1,118,261 blood recipients over a 20 years follow-up.

From the findings in this thesis and as has been alluded to by the work of Shulman and Saxena [7], it is apparent that HTCs are critical in overseeing in-hospital transfusion activities. They should be urgently established in Uganda to define policies concerning issues like (list is not exhaustive):

- consent for transfusion
- refusal of transfusion
- pretransfusion testing orders (use of Type and Hold ,Type and Screen, Type and Crossmatch)
- surgical blood order schedules
- ordering practices including when to initiate transfusion, what product to administer, rate of administration.
- clinical alternatives to blood transfusion
- patient identification (both at time of specimen collection and at time of blood product transfusion)
- blood product administration practices (e.g., connecting the blood, which type on infusion set to use, what IV fluid is compatible)

The HTC should then take the initiative to train in service physicians and nurses on the operationalization of these policies. Additionally, HTCs should advocate for curricular reviews in various medical, nursing, laboratory and paramedical training institutions so that basic training on appropriate bedside transfusion practices is properly addressed and at an early stage of career development.

9.2 HUMAN RESOURCES

In order to provide quality bedside and laboratory transfusion services, each hospital should develop and implement a staffing plan which identifies how many employees, with what level of training are needed to meet workload requirements. [8, 9] This study has identified shortages of staff at the bedside, hospital transfusion laboratories and blood bank laboratories. This affects the quality of service delivery, thus many clinicians assert that the informed consent process is such a time consuming activity which can not be undertaken with the patient load that has to be attended to by a limited staff. Other bedside procedures like pre-transfusion sample acquisition and administration of blood are inconsistently done because of shortage of trained staff and lack of supervision of the students who actually perform these procedures, albeit inconsistently.

Hospital transfusion laboratories are also poorly staffed. This is reflected by the delays between ordering for blood and delivery of a cross-matched unit to the utility stations [ward, theatre or intensive care unit (ICU)] in larger hospitals with a high patient load but with limited laboratory staff.

The shortage of staff stretches up to the supplying Regional Blood Bank. Thus one of the bottlenecks of blood processing in these banks is limited staff in the grouping and TTI testing sections. It has been observed that collected blood spends a considerable amount of time in these banks and is not made available in a timely manner to hospitals whose demands are on the rise.

Paucity of the human resource in the health sector directly impacts on the quality of service delivery and indirectly affects key health indicators. In their cross-country econometric study and after controlling for other determinants in a logistic regression, Anand and Bärnighausen [10] confirmed that the number of staff in the health sector significantly determined maternal, infant and under-five mortality rates.

The human resource crisis is caused by many factors such as inadequate production, inability to hire due to limited budgets, brain drain, poor motivation, conflict of interests, and misuse of resources, including time. An overwhelming majority of health workers are concentrated in urban areas leaving many rural health facilities which care for up to 80% of Uganda's population with a limited number of clinicians.

In comparative audits of bedside transfusion practices in the United Kingdom Taylor and others [11] indentified a progressive improvement in measurable bedside practices after implementation of effective human and organizational structures in the studied Hospitals.

The participants in the study have identified strategies to address shortages in quality and quantities of the human resource. These include review of medical training curricula to ensure production of health workers who are equipped with knowledge and skills required to meet the demands of safe transfusion practices. Secondary, there is need to review human resource policies that enforce rigid ceilings on recruitments. This will improve bedside and laboratory quality of care. Third, continued professional development has been singled out as a strategy of keeping in-service staff abreast with developments in Transfusion Medi-

cine. This should be based on simple, accessible, locally designed and administratively approved training materials. The established structure should give room for some staff to attend training workshops and seminars while others cover the routine work processes.
The plans to respond to this crisis should be supported by political commitment and appropriate allocation of resources. All political and social opportunities capable of helping to raise awareness on the shortage of staff in the transfusion services should be pursued.

9.3 CUSTOMER ISSUES

The customers of in-hospital transfusion services include clinicians who prescribe, and patients who subsequently receive blood. Each of these two has particular expectations. Amidst anxiety and lack of medical knowledge, the patients expect to receive a safe and efficacious blood component. The clinicians expect the transfusion services in and outside the hospital to supply timely, adequate, safe and cost-effective blood products to his or her patient. It is important to assess customer satisfaction with a product or a service. This helps policymakers and blood center managers reshape their systems by focusing on activities that have the greatest impact on satisfaction while deemphasizing costs associated with those with the least customer satisfaction. It also gives confidence to hospitals (clinicians and patients) to look to their blood suppliers to keep them abreast of changes in regulations, technologies, and treatments. It further suggests that hospitals look to their blood suppliers to assist them in resolving blood-related issues associated with difficult patients.[12, 13] This thesis has demonstrated failed customer satisfaction at the clinician-patient interface. Thus, despite the fact that patients are cognizant of their right to get information concerning blood safety, the bedside practices are still based on the paternalistic principal other than participatory decision making before a transfusion. The patients painfully surrender their right to the clinicians whom they trust and assume to know it, all albeit working without transfusion guidelines. This contravenes the ethical principal of patient autonomy and is bound to lead to litigation in situations of cultural or religious conflicts.

This work has also demonstrated lack of customer satisfaction at the blood supplier-clinician interface. There is lack of communication to the clinicians of the rigor and costs involved in donor motivation and mobilization, their medical examination, collection, processing, testing and storage of blood products. Additionally, the transfusion service does not adequately inform her customers of the spectrum of available blood components. These information gaps have lead to suboptimal ordering and blood use in Ugandan hospitals. Satisfaction with the routine delivery schedule is a measure of blood center reliability. Reliability of blood centers is important to hospitals because an inadequate blood supply may pose a danger to patients, since the proper amount and type of blood may not be available when needed. Blood shortages can lead to longer hospital stays and poor outcomes if elective procedures must be postponed to wait for adequate supplies of blood. Such shortages increase costs and present numerous possible risks for patients,[14] thereby contributing to an increase in the national burden of disease.
As suggested by many participants in this thesis, the solution to these communication and supply gaps lies in development of functioning Hospital Transfusion Committees (HTCs). These can lobby and advice hospital top management to install modern communication systems to assist a proper flow of information from blood utility stations (wards, theatres

and intensive care units) to hospital transfusion laboratories. The HTCs will also act as conveyers of information between the hospital settings and the supplying blood banks. From one end, the blood banks will provide information on existing stocks and relevant scientific advancements to the clinicians through the HTCs, while from the clinical setting the HTCs will update the blood banks with the epidemiology of and trends in blood needs. This will ensure adequate and timely allocation of transfusion service logistics for proper patient management.

9.4 EQUIPMENT AND SUPPLIES

It has been established that there are shortages of equipment and supplies both in the hospitals and in the blood banks. These directly affect the quality of transfusion practices in Ugandan hospitals. Regarding the bedside blood ordering process and the procedure of acquiring the pretransfusion sample in particular, it has been observed that the collection tubes are always in short supply, so clinicians use the same needle and syringes for drawing and transportation of samples to test laboratories. There are no transportation facilities for samples in Ugandan hospitals that guarantee compliance with the basic cold chain conditions needed. Whoever is performing this procedure handles the sample by hand. This compromises the quality of the samples and is bound to lead to erroneous testing and compatibility results. In blood selection and compatibility testing procedures, particularly in transfusion laboratories of large hospitals, the reagents are in short supply. The laboratory technicians go around this by diluting the reagents in ratios of 1:3 so as to cover the workloads of high blood demands However, diluted reagents may not detect weak red cell antigens at blood typing and compatibility testing, which can result into hemolytic reactions in blood recipients.

The blood cold chain is broken in the hospital settings due to use of inappropriate transportation and storage facilities for blood. Thus, blood is transported by hand, without cool boxes and over long distances between test laboratories and utility stations. It is stored in domestic refrigerators, in situations of poor hygiene and asepsis, and frequent power shutdowns therefore under un-controlled temperatures. The bedside process of administration of blood to patients is also characterized by shortages of consumables like infusion sets, skin disinfectants and protective gloves. These shortages compromise the intended use and quality of blood transfusions. Technological advances have improved the quality of the transfusion chain within the hospital setting. Thus, introduction of the Bar code system [15] has improved patient, pretransfusion sample and unit identification. Use of the pneumatic tube system [16, 17] ensures quick delivery of acceptable pretransfusion test samples from the bedside to the test laboratories. Currently Uganda's health expenditure per capita per annum is 1 US dollar. Therefore, health care facilities chronically run under budget deficits that lead to shortage of hospital drugs, transfusion alternatives, consumables and equipment. The above shortages are an example of the situation in many Sub-Saharan countries [18] and are comparable to the finding in the war ravaged Afghanistan. [19]

9.5 DOCUMENTATION

Collection and documentation of information is an integral part of quality management. It must be based on a well planned, written and managed institutional or organizational policy. Documentation provides a framework for understanding and communication throughout the organization. [20] Documents describe how processes and procedures are intended to work, how they interact, where they must be controlled, what their requirements are, and how to implement them. Records provide evidence that the process or procedure was performed and provide information needed to assess the quality of products and services as intended. Written policies, process descriptions, procedures, work instructions, labels, forms, and records are all part of the facility's documentation system. [20, 21]
This thesis has established that the blood ordering process is poorly documented. Thus, some blood orders are placed without a documented clinical diagnosis, the reason for transfusion, hemoglobin level or the expected transfusion outcome. This is mainly due to the fact that most Ugandan hospitals have not come up with a regulatory policy on blood ordering that would clearly define the requirements at this stage.
Documents should be developed in a format that conveys information clearly and that provides staff with the necessary instructions and templates for recording data. [22] A blood request form (BRF) is an important tool of communication of blood needs to the hospital transfusion laboratories. The design and management of the currently used blood request form at Mulago Hospital influences the clinicians' performances during blood ordering. It represents patient identifiers – family name and given name as *Name* only, a better identifier – date of birth as *Age*. It elicits the 'would be' detailed history of any previous transfusions as just history of transfusion. Its design is also out of date as the amount blood requested is represented in bottles instead of units or bags. In the bid to control the utilization of this poorly supplied document, copies of the form are kept in the hospital transfusion laboratory and filled by whoever delivers a test sample to the laboratory. The inadequate design and management of this document confuses the prescribing clinician hence the observed non compliances to the document. [23] It is imperative therefore that Mulago Hospital in accordance to a well written National transfusion policy periodically reviews, modifies and reapproves its transfusion documents as needed to keep them current. It should also ensure that documents are legible, identifiable, and readily available in the locations where they will be used.

It has been established that during the process of component selection and compatibility testing, the time the request reaches the laboratory, the quality of test samples and the time when the unit of blood is signed, are inconsistently documented. This implies that it is difficult to conduct an internal audit so as to control and improve processes, since these critical control points are not documented. The quality of documentation during the process or procedure of blood administration to the patient was also found wanting. There are no process instructions or predesigned forms such as a transfusion reaction form (TRF) to assist clinicians document time a transfusion is started, the baseline vital signs, events occurring during or outcomes of a transfusion. Lack of documentation at this stage impacts directly on patients' safety and the total bedside quality management. A clinically efficacious transfusion should be infused over a maximum period of time (run a unit of 450 ml of red cell concentrates 3 to 4 hours or 150-300 ml per hour in adults). Participating hospitals in this thesis use too narrow bore intravenous needles for blood infusion due to shortage of supplies. This implies that transfusions run over variable and prolonged periods which re-

sults in compromised safety and quality of the transfused product. Despite their compromised potency and safety, the clinician monitoring such transfusions cannot discontinue them since he does not have a documented baseline commencement time. The clinician attending to a patient receiving a blood product cannot easily attribute any adverse reaction that may occur during or immediately after a transfusion to the infused product since there is no record of baseline vital signs. It would be difficult to ensure a proper vein to vein traceability and therefore develop a hemovigilance program if the events occurring during the blood administration process are not recorded.
The identified weaknesses in the hospital documentation systems offer opportunities to first and foremost do process mapping of all transfusion activities using flow charts. The process maps can then be used as templates to describe the identified processes (process descriptions) and write simple, clear and accessible standard operating procedures (SOPs). These will list the critical steps that need documentation and provide information regarding the aims and scope of each step. This should be followed by training of clinicians and laboratory staff on the developed documents and finally perform periodic staff competence assessment to certify staff abilities in and adherence to using the SOPs.

This thesis provides an evidence based opportunity to stake holders to start designing other critical documents like hospital transfusion quality manuals, process and procedure instruction manuals, transfusion reaction forms, bedside delivered and un-used blood registries which are non existent at the moment in many hospitals in Uganda. A well designed documentation policy will ensure harmonization of these documents at National level so that they capture uniform and consistent data that will form a foundation for initiating a nationwide hemovigilance program. [22]

9.6 WORK ENVIRONMENT

Each institution, hospital or transfusion service must have a policy that guides provision of a safe environment to donors, patients and staff. This environment should be conducive for the smooth running of procedures. [24] It has been found that staff in hospitals and blood banks perform their tasks in narrow and crowded spaces. This affects the quality of their work output. Small and crowded work spaces are characterized by poor hygiene and tidiness, and a high rate of human errors which call for urgent attention by the laboratory or ward manager if patient safety is to be assured. Thus, regional referral hospitals with congested and busy transfusion laboratories, registered prolonged turnaround time of effecting a blood order from the utility stations (wards, theatres or ICUs). It was also noted that regional blood banks with narrow and crowded work space for the information technology and blood testing sections, registered a long quarantine time before blood is released to hospitals. These delays in the supplying banks and laboratories influence the ordering practices of clinicians. Here clinicians are forced to place larger orders than they actually need. They then store the un-used blood in uncontrolled domestic ward refrigerators under uncontrolled temperatures, hygiene and asepsis. The delays lead to deterioration of patients' conditions especially in emergency situations and postponement of elective surgical procedures with the subsequent increased hospital stays. The above situations compound each other in compromising blood safety therefore increasing the risks of a transfusion in such a setting with as a consequence an increase in the burden of disease.

Work space problems were also identified in operating theatres. Due to lack of operating theatre space, a patient presenting with a fractured femur can only undertake his or her surgical procedure not less than five days from the day of admission to hospital. This delayed surgery is accompanied by excessive blood loss during and after surgery, leading to increased use of allogeneic blood in the peri-operative period.

This thesis also points out gaps in communication between work stations or departments along the vein to vein chain of blood transfusion. Thus, the clinicians' knowledge about availability and use of the blood products in their respective supplying banks was found wanting. Likewise the Regional Blood Bank staff does not understand the dynamics of blood needs at the clinical setting. [26] This lack of knowledge flow affects execution of duties on both side of the interface. On one hand the clinicians sub optimally place their blood orders, while on the other hand the blood bank establishment inappropriately allocates its procurement and distribution logistics. This is partly alluded to from the direct quotation of one key informant interviewee: *"...we do not issue blood according to what has been ordered. Many times the clinicians over order. So our issues depend on what we have in stock."* , illustrating the current supply driven transfusion system in Uganda.
As has been suggested by a number of participants in the studies done, that the above problems can be mitigated by increased allocation of funding in capital developments of blood establishments. This will ensure construction of premises that will allow effective cleaning, minimize the risk of product contamination and provide a safe working environment to staff. These will provide adequate space, light, running water and constant power supply with backup generators to guard against blood wastage in case of interruption in electricity supply.

In the congested clinical settings, procedures should be in place to address general infrastructure, patient and staff safety. These will include strategies to handle electric accidents, fires and preparedness to deal with any other disasters and incidents through appropriate contingency planning. In the laboratory setting efforts should be centered on management of bio-hazardous waste and protecting staff against blood borne pathogens. This is evidenced in one laboratory technician remarks: *"I wish the blood bank administration could provide immunization against Hepatitis B and Hepatitis C for its entire laboratory staff. This would make us feel confident to handle these samples."* A policy to regulate and enforce hospital laboratory discipline should be developed. This will limit and control movement, in particular unauthorized, into blood and blood product storage areas. These areas should be fitted with audible and visual temperature alarms to alert staff in case temperatures in blood storage cabinets deviates from set ranges. There should be developed simple, clear and accessible SOPs describing actions to be taken in case work environment hazards and temperature changes do occur.

9.7 BEDSIDE BLOOD MANAGEMENT

One of the strategies to improve the bedside process of blood ordering is to standardize the procedure of peri-operative blood ordering and use in elective surgery. Efficacious blood use in elective surgery requires that hospitals develop systems to establish the exact amounts of blood lost during the commonly offered surgical interventions. This should be followed by scientifically testing the accuracy of blood order schedules for each of these surgical procedures. Likewise hospitals ought to develop and implement guidelines on blood ordering and use in emergency situations like massive transfusions on obstetrics and following trauma.

The magnitude of peri-operative blood loss in open reduction and internal fixation (ORIF) of femoral fractures is influenced by a number of patient, physician and institutional factors. This thesis has established institutional and patient factors as major contributors to blood loss during and immediately after this procedure. Lack of enough theatre space delays access to surgery in this institution. These delays before surgery in trauma are characterized by consumption coagulopathies that are followed by excessive intra- and postoperative hemorrhage. Additionally, lack of theatre equipment like fracture tables and diathermy which are a standard in operative fracture management in the more developed word, contribute to massive intra-operative blood loss due to technical difficulties in carrying out the surgery. These shortages lead to prolonged operation time and often increased blood loss during surgery.
Forty seven out of the ninety three enrolled patients for ORIF (Chapter 5) had severely complicated fractures types B and C. It is technically difficult to reduce these types of fractures especially if the procedure is delayed. This takes a lot of operation time and is often accompanied by excessive peri-operative blood loss, hence blood transfusion.
From the above shortcomings in the operating theatre (OR), and the un-controlled peri-operative blood ordering and use, it is apparent that there is a compromised quality of life of a patient undertaking surgery in such a setting, which seriously impacts on the hospital burden of disease.
In the bid to address the peri-operative blood order and use in ORIF of femur fractures, the surgeons readjusted their transfusion triggers at a lower pre-operative hemoglobin level and in accordance to the SBOE. This resulted into saving of the hospital blood transfusion resources in doing un-necessary cross matches and managing a large inventory.

9.8 CONCLUSIONS

This thesis has unearthed major loopholes in the bedside transfusion practices and at the blood supplier-user interface that need urgent attention by all stake holders.

Transfusion informed consent

- The knowledge base of Ugandan clinicians as regards the transfusion informed consent is not adequate.
- There is no administrative framework in Ugandan hospitals to ensure dispensation of a transfusion informed consent
- The blood recipients have no experience about transfusion consent because this is a neglected process in bedside transfusion practices in Uganda.

Blood ordering

- There is a suboptimal documentation of the blood ordering process in Uganda's major teaching hospital. This directly affects the quality of the blood selection process in the hospital blood bank.
- The inadequate communication of patient information to the blood bank is partly due to the outdated blood request form that is currently used, but also due to the un-acceptable management of this document (blood request forms are filled from the blood bank but not at the bedside).
- A patient undertaking elective surgery for a major procedure like open reduction and internal fixation of an isolated unilateral femur fracture in Mulago Hospital theater looses a substantial amount of blood at surgery. This is partly due to delayed surgery but also due to lack of proper theater equipment to reduce blood loss at surgery.
- The introduction of the Surgical Blood Order Equation as a guide to peri-operative blood ordering in femora fracture surgery has reduced significantly the cross-match-to-transfusion ratio for this procedure. This has been accompanied by considerable cost-savings on the hospital blood bank logistics.

Administration of blood to patients

- The bedside process of administering blood to patients at Mulago Hospital is far from optimal. There are continuing inconsistencies in the performance of procedures like-blood transportation to the utility stations, blood reception, patient identification, monitoring of a patient undertaking a transfusion and documentation of transfusion events.

The interface between blood users and suppliers

- There is paucity of knowledge among clinicians about the available blood products in there respective supplying hospital and regional blood banks.
- The clinicians do not fully appreciate the value of the use of the supplied blood products.
- The blood bank staff does not fully appreciate the clinical blood needs of the hospitals they supply.
- The blood banks do not supply adequate and timely blood products to hospitals due staff shortages, and inadequate managerial and infrastructural facilitation.

The identified loopholes in the hospital transfusion practices result from institutional factors like lack of a proper administrative organizational mechanism to oversee and implement good clinical practices, lack of appropriate equipment and poor work environment. They also come up as a result of clinician factors like lack of basic Transfusion Medicine knowledge that is necessary to carry out critical bedside procedures. Overall the observations made clear that the absence of a defined and developed hospital quality and quality management system with adequate documentation and a mechanism for daily monitoring and evaluating practices that include blood transfusion needs an urgent top down address.

9.10 RECOMMENDATIONS

A

In line with the WHO Executive Board recommendations to the Sixty-third World Health Assembly,[26] Uganda as a WHO Member State in good standing should update her national legislations and related regulatory structure on clinical use of blood. This will entail development of National regulatory authorities with administrative instruments to ensure control in the areas of quality and safety of blood products across the entire transfusion chain. At hospital level, this will involve creation and facilitation of Hospital Transfusion Committees (HTCs). These should consist of hospital staff from various blood prescribing departments and at least a member from the UBTS Regional Blood Bank. They will be charged with development, implementation, monitoring and evaluation of policies and strategies to streamline the in-hospital transfusion processes.
It should be noted that cooperation and support from the hospital high authorities is paramount in the proper running of HTC activities.

B

In order to ensure internationally acceptable health care to blood recipients, Uganda should develop locally acceptable hospital standards (quality and technical) to streamline the various procedures in the three main processes. They should be realistic, reliable, valid, clear and measurable.
They should include standards on:

- reaching a diagnosis and setting the indication for blood.
- seeking an informed consent for blood transfusion
- making a blood order
- taking and labeling a pre-transfusion sample
- transportation of blood samples and products within the hospital setting
- storage of blood products in the laboratory, wards, theaters and intensive care units
- reception of pre-transfusion samples in the hospital transfusion laboratories
- blood component selection
- issuing of blood components from the transfusion laboratory
- reception of blood at the utility station with accompanying patient identification
- connection and starting a transfusion
- patient monitoring during a transfusion
- managing adverse transfusion reactions

Based on the developed standards, the HTC should come up with simple guidelines that should be compiled in a pocket book and disseminated to all technical and clinical staff engaged in transfusions.

C

Documentation is the mainstay of quality improvement of any health service. The culture of documenting all steps in a transfusion event should be developed and institutionalized in all Ugandan health facilities that administer blood to patients. Items or situations to be documented should carefully be selected to guard against over-documentation. Focus should be centered on the critical control points of the three in-hospital transfusion processes. There should be an enabling environment to develop and promote this culture. This includes:

> writing policies to provide support, guidance and reinforcement of documentation as an integral part of improving quality in transfusion practices.
> leadership (e.g. from HTCs) to set priorities and promote a learning atmosphere for all concerned staff. This will also advocate for supportive policies and allocation of resources to the documentation exercise.
> defining core values of documenting transfusion events. These should be promoted and practiced to ensure quality care through adequate traceability.
> sufficient allocation of competent human and adequate material resources for conducting the documentation exercise.
> designing up to date operational documents like a standard Blood Request Form or Transfusion Reaction Form.
> instituting a standard way of record keeping and archiving of transfusion events.

D

The formulated standards and guidelines should be communicated to the health workers in hospitals and students in training institutions. This will be achieved by:

> reviewing training curricula of all health professionals to include key issues in hospital transfusion practices addressed by the technical and quality standards.
> training of all levels of health workers dealing with blood transfusion.

To ensure appreciation of challenges in the production and utilization settings by upcoming clinicians, residents, medical and paramedical students rotations (sometime of their training) should rotate in Regional Blood Banks. Likewise, blood bank staff should conduct bedside training sessions for clinicians and students on new Transfusion Medicine developments.
Before any health worker is allowed to perform any in-hospital transfusion procedure, he/she should undertake and satisfy the requirements of a competence test for that procedure. This may be an oral or a practical test which needs to be documented.

E

There should be an agreed upon periodic audit of practices of clinicians, nurses and laboratory technicians. This should be conducted jointly by members of the HTC and a blood bank staff member. It should always be followed by timely and constructive feedback to the concerned staff or department. This will build confidence and respect for each other which are prerequisites for quality improvement in health care.

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